

CLAIMS

What is claimed is:

- 5 1. A hairpin nucleic acid, having the following characteristics:
- (a) being self-complementary; and
 - (b) having a first restriction site for a nicking endonuclease, said restriction site comprising a recognition sequence and a cleavage site, wherein said recognition sequence is situated so that said cleavage site is before, at, or
- 10 beyond the 3' end of the hairpin nucleic acid.
2. The hairpin nucleic acid of claim 1, further comprising one or more modifications to allow hairpin nucleic acid attachment to a solid substrate.
- 15 3. The hairpin nucleic acid of claim 1, further comprising a second restriction site for a blunt-end endonuclease, said second restriction site comprising a second recognition sequence and a second cleavage site, wherein said second recognition sequence is situated so that said second cleavage site is before, at, or beyond the 3' end of the hairpin nucleic acid.
- 20 4. A method for recovering a single-stranded template nucleic acid, the method comprising:
- (a) providing a single-stranded template nucleic acid attached to the 5' end of a hairpin nucleic acid, wherein the hairpin nucleic acid is self-complementary
- 25 and has a first restriction site for a nicking endonuclease, said restriction site comprising a recognition sequence and a cleavage site, wherein said recognition sequence is situated so that said cleavage site is before, at, or beyond the 3' end of the hairpin nucleic acid, and wherein said hairpin nucleic acid is a self-hybrid, and wherein a nucleic acid strand complementary to the
- 30 template nucleic acid is attached to the 3' end of the hairpin nucleic acid;

- (b) contacting the hairpin nucleic acid with said nicking endonuclease, under conditions where the nicking endonuclease cleaves before, at or beyond the 3' end of the hairpin nucleic acid, thereby providing a nicked hairpin-template-complement nucleic acid complex; and
- 5 (c) subjecting the nicked hairpin-template-complement nucleic acid complex to conditions whereby the nucleic acid strand complementary to the template nucleic acid dissociates from the template nucleic acid; thereby recovering the single-stranded template nucleic acid.

- 10 5. The method of claim 4, wherein the hairpin nucleic acid is attached to a solid substrate.
6. An addressable array, comprising a hairpin nucleic acid of claim 2, wherein the hairpin nucleic acid is attached to a solid substrate.
- 15 7. An addressable comprising a plurality of the hairpin nucleic acids of claim 2, wherein adjacent hairpin nucleic acids are separated by a distance of at least 10nm.
8. The addressable array of claim 7, wherein the hairpin nucleic acids are separated by a distance of at least 100nm.
- 20 9. The addressable array of claim 7, wherein the hairpin nucleic acids are separated by a distance of at least 250nm.
- 25 10. The addressable array of claim 7, wherein the density of the hairpin nucleic acids is from 10^6 to 10^9 polynucleotides per cm^2 .
11. The addressable array of claim 7, wherein the density of the hairpin nucleic acids is from 10^7 to 10^8 molecules per cm^2 .

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12. A kit, comprising a hairpin nucleic acid of any of claims 1 to 3, and packaging components therefor.
13. A kit, comprising the addressable array of any of claims 6 to 11.
- 5 14. A double-stranded nucleic acid anchor, having the following characteristics:
- (a) having a first end and a second end; and
 - (b) having a first restriction site for a nicking endonuclease, said restriction site comprising a recognition sequence and a cleavage site, wherein said
- 10 recognition sequence is situated so that said cleavage site is located before, at, or beyond the 3' end of the first end of the double-stranded nucleic acid anchor.
- 15 15. The double-stranded nucleic acid anchor of claim 14, further comprising attachment of the second end to a solid substrate.
16. The double-stranded nucleic acid anchor of claim 14, further comprising a second restriction site for a blunt-end endonuclease, said second restriction site comprising a
- 20 second recognition sequence and a second cleavage site, wherein said second recognition sequence is situated so that said second cleavage site is located before, at, or beyond the 3' end of the first end of the double-stranded nucleic acid anchor.
17. A method for recovering a single-stranded template nucleic acid, the method comprising:
- 25 (a) providing a single-stranded template nucleic acid attached to a double-stranded nucleic acid anchor, and wherein a nucleic acid strand complementary to the template nucleic acid is attached to the double-stranded nucleic acid anchor, and wherein the double-stranded nucleic acid anchor:
- (i) has a first end and a second end; and
 - (ii) has a first restriction site for a nicking endonuclease, said restriction
- 30 site comprising a recognition sequence and a cleavage site, wherein

said cleavage site is situated so that said cleavage site is before, at, or beyond the 3' end of the first end of the double-stranded nucleic acid anchor;

wherein the single-stranded template nucleic acid is attached to the 5' end of the first end of the double-stranded nucleic acid anchor, and wherein the nucleic acid strand complementary to the template nucleic acid is attached to the 3' end of the first end of the double-stranded nucleic acid anchor;

(b) contacting the double-stranded nucleic acid anchor with said nicking endonuclease, under conditions where the nicking endonuclease cleaves before, at, or beyond the 3' end of the first end of the double-stranded nucleic acid anchor, thereby providing a nicked anchor-template-complement nucleic acid complex; and

(c) subjecting the nicked anchor-template-complement nucleic acid complex to conditions whereby the nucleic acid strand complementary to the template nucleic acid dissociates from the template nucleic acid;

thereby recovering the single-stranded template nucleic acid.

18. The method of claim 17, wherein the double-stranded nucleic acid anchor further comprises attachment of the second end to a solid substrate.

19. An addressable array, comprising a double-stranded nucleic acid anchor of claim 15, wherein the double-stranded nucleic acid anchor is attached to a solid substrate.

20. An addressable array, comprising a plurality of the double-stranded nucleic acid anchors of claim 15, wherein adjacent hairpin nucleic acids are separated by a distance of at least 10nm.

21. The addressable array of claim 20, wherein the double-stranded nucleic acid anchors are separated by a distance of at least 100nm.

22. The addressable array of claim 20, wherein the double-stranded nucleic acid anchors

are separated by a distance of at least 250nm.

23. The addressable array of claim 20, wherein the density of the double-stranded nucleic acid anchors is from 10^6 to 10^9 polynucleotides per cm^2 .

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24. The addressable array of claim 20, wherein the density of the double-stranded nucleic acid anchors is from 10^7 to 10^8 molecules per cm^2 .

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25. A kit, comprising a double-stranded nucleic acid anchor of claims 14, and packaging components therefor.

26. A kit, comprising the addressable array of any of claims 19 to 24.